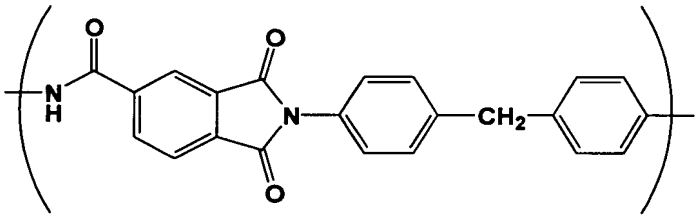
CLAIMS

1. A porous film having a thickness of 5 to 100 μm, characterized by comprising a porous layer of a polyamide-imide resin having a glass transition temperature of 70°C or higher and an inherent viscosity of 0.5 dl/g or higher and containing a unit represented by the following structural formula (I), an amount of the unit being 20 mol% or more based on all repeating structural units.



(I)

2. The porous film according to claim 1, wherein the polyamide-imide resin is a copolymer polyamide-imide resin such that a part of an acid component thereof is substituted with at least one kind selected from the group consisting of dimer acid, polyalkylene glycol, polyester and butadiene rubber containing any of a carboxyl group, a hydroxyl group and an amino group at a terminal.

3. The porous film according to claim 1, wherein the porous film of a polyamide-imide resin is a monolayer.

4. A composite porous film characterized in that a polyamide-imide resin porous film according to claim 1 and a polyolefin porous film are combined.

5. The porous film according to claim 1, wherein a gas permeability is 1 to 2000 sec/100ccAir.

6. A lithium-ion secondary cell comprising a positive electrode and a negative electrode capable of occluding/releasing a lithium ion and the porous film according to any one of claims 1 to 5 disposed as a separator between the electrodes.

7. A process for producing a porous film, wherein the polyamide-imide resin solution according to claim 1 or 2 is applied on one surface or both surfaces of a substrate, or a substrate is immersed in the polyamide-imide resin solution according to claim 1 or 2, and thereafter the substrate is applied to a solution to be mingled with a solvent for dissolving the polyamide-imide resin and to be a poor solvent for the polyamide-imide resin to then coagulate the polyamide-imide resin.

8. A process for producing a composite porous film, wherein the polyamide-imide resin solution according to claim 1 or 2 is applied on one surface or both surfaces of a polyolefin porous film, or a polyolefin porous film is immersed in the polyamide-imide resin solution according to claim 1 or 2, and thereafter the polyolefin porous film is applied to a solution to be mingled with a solvent for dissolving the polyamide-imide resin and to be a poor solvent for the polyamide-imide resin to then coagulate the polyamide-imide resin.

9. A porous film having a thickness of 5 to 100 μm, characterized by comprising a porous layer of a polyamide-imide resin having a glass transition temperature of 70°C or higher, an inherent viscosity of 0.5 dl/g or higher and an amide bond/imide bond ratio of from 10/90 to 45/55.

10. The porous film according to claim 9, wherein a part of an acid component of the polyamide-imide resin is one kind, or two kinds or more of alkylene glycol bisanhydrotrimellitate, pyromellitic anhydride, benzophenone tetracarboxylic anhydride and biphenyltetracarboxylic anhydride.

11. The porous film according to claim 9, wherein the polyamide-imide resin is a copolymer polyamide-imide resin such that a part of an acid component thereof is substituted with at least one kind selected from the group consisting of dimer acid, polyalkylene glycol, polyester and butadiene rubber containing any of a carboxyl group, a hydroxyl group and an amino group at a terminal.

12. The porous film according to claim 9, wherein the porous film of a polyamide-imide resin is a monolayer.

13. A composite porous film characterized in that a polyamide-imide resin porous film according to claim 9 and a polyolefin porous film are combined.

14. The porous film according to claim 9, wherein a gas permeability is 1 to 2000 sec/100ccAir.

15. A lithium-ion secondary cell comprising a positive electrode and a negative electrode capable of occluding/releasing a lithium ion and the porous film according to any one of claims 9 to 14 disposed as a separator between the electrodes.

16. A process for producing a porous film, wherein the polyamide-imide resin solution according to any one of claims 9 to 11 is applied on one surface or both surfaces of a substrate, or a substrate is immersed in the polyamide-imide resin solution according to any one of claims 9 to 11, and thereafter the substrate is applied to a solution to be mingled with a solvent for dissolving the polyamide-imide resin and to be a poor solvent for the polyamide-imide resin to then coagulate the polyamide-imide resin.

17. A process for producing a composite porous film, wherein the polyamide-imide resin solution according to any one of claims 9 to 11 is applied on one surface or both surfaces of a polyolefin porous film, or a polyolefin porous film is immersed in the polyamide-imide resin solution according to any one of claims 9 to 11, and thereafter the polyolefin porous film is applied to a solution to be mingled with a solvent for dissolving the polyamide-imide resin and to be a poor solvent for the polyamide-imide resin to then coagulate the polyamide-imide resin.